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# **Notice of Allowability**

Application No.

10/796,567

Examiner

Juan A. Torres

Applicant(s)

GIANNAKIS ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment - After Non-Final Rejection filed on 09/29/2007.
2. ☒ The allowed claim(s) is/are 1-24 and 26-45 (renumbered 1-44).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## **Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 08/07/2007 9/24/07
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other Corrected 03/24/2005 IDS.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 08/07/2007 and 09/24/2007 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Regarding reference number 21 (see argument section of the Amendment - After Non-Final Rejection filed on 09/24/2007) the Examiner agrees with the publication date of Q2 2001.

It seems that from <http://portal.acm.org/citation.cfm?id=621733&dl=GUIDE&coll=GUIDE> (see search notes and reference 7 of the link above) that the reference was available, at least on-line, on April 30, 2001, (7 J. Foerster, et al., "Ultra-Wideband Technology for Short- or Medium-Range Wireless Communications," <i>Intel Technology J., </i> Q2, 2001, [http://intel.com/technology/itj/q22001/articles/art\\_4.htm](http://intel.com/technology/itj/q22001/articles/art_4.htm) (current 30 Apr. 2001)).

Regarding reference number 65 (see argument section of the Amendment - After Non-Final Rejection filed on 09/24/2007) Attached is reference 65 with the appropriate date.

### ***Drawings***

The modifications to the drawings were received on 09/24/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/24/2007, the Examiner withdraws drawings objections of the previous Office action.

***Specification***

The modifications to the specification were received on 09/24/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/24/2007, the Examiner withdraws specification objections of the previous Office action.

***Claim Objections***

The modifications to the claims were received on 09/24/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/24/2007, the Examiner withdraws claim objections to claims 17, 18, 29 and 38 of the previous Office action.

***Claim Rejections - 35 USC § 112***

The modifications to the claims were received on 09/24/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 09/24/2007, the Examiner withdraws claim rejections under 35 USC 112 second paragraph to claims 16 and 40 of the previous Office action.

***Response to Arguments***

Applicant's arguments, see Amendment - After Non-Final Rejection, filed 09/24/2007, with respect to claims 1, 5, 20, 24 and 41 have been fully considered and are persuasive. The rejections of claims 1, 5, 20, 24 and 41 have been withdrawn.

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Raymond R. Berdie on 10/03/2007.

The application has been amended as follows:

- a) In line 11 of claim 6 the recitation " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ " is changed to " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ , where  $m$  is an integer"
- b) In line 11 of claim 15 the recitation " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ " is changed to " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ , where  $m$  is an integer"
- c) In line 13 of claim 26 the recitation " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ " is changed to " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ , where  $m$  is an integer"
- d) In line 9 of claim 35 the recitation " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ " is changed to " $m \in [0, M-1]$  with  $M \geq 2$  and  $n \in [0, N_F-1]$ , where  $m$  is an integer"
- a) In line 2 of claim 45 the recitation "priority" is changed to "polarity"

### ***Allowable Subject Matter***

Claims 1-24 and 26-45 (renumbered 1-44) are allowed.

The following is an examiner's statement of reasons for allowance: Claims 1-24 and 26-45 (renumbered 1-44) are allowed because a comprehensive search of prior art failed to teach, either alone or in combination, processing a data stream of information-

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bearing symbols to form bursts of information symbols, arranging training symbols within the stream of information-bearing symbols to ensure at least one polarity transition within every set of three consecutive training symbols at a receiver to synchronize timing of a transmitter and the receiver, and outputting the bursts of information-bearing symbols and training symbols as an ultra wideband (UWB) waveform through a communication channel to the receiver; receiving an ultra wideband (UWB) waveform through a wireless communication channel, wherein the received UWB waveform comprises bursts of information-bearing symbols, selecting a template to be used for estimating the timing offset of a burst of the received UWB waveform, wherein the template comprises a segment of a burst of the received UWB waveform, correlating the template with a segment of a burst of the received waveform so as to form an estimate of the timing offset of the received UWB waveform and outputting a stream of symbol estimates in accordance with the estimated timing offset; a pulse generator that processes a data stream of information bearing symbols to form bursts of information bearing symbols and arranges training symbols within the stream of information-bearing symbols to ensure at least one polarity transition within every set of three consecutive training symbols at a receiver to synchronize timing of a transmitter and the receiver, and a pulse shaping unit that outputs an ultra wideband (UWB) transmission waveform from the bursts of information-bearing symbols and training symbols; an antenna to receive an ultra wideband (UWB) waveform through a wireless communication channel, wherein the received UWB waveform includes bursts of information-bearing symbols, a timing synchronization unit to form an estimation of a

timing offset based on the received UWB waveform by selecting a template comprising a segment of a burst of the received UWB waveform, and by correlating the template with a segment of a burst of the received waveform and a symbol detector to output a stream of estimate symbols based on the estimate of the timing offset; and a transmitter that processes a data stream of symbols to form bursts of information-bearing symbols and generates an ultra wideband (UWB) waveform through a wireless communication channel, and a receiver that receives the transmitted signal through a wireless communication channel, selects a segment of the received UWB waveform to use as a template, forms an estimate of the timing offset based on the correlation of the template with a segment of a burst of the received UWB waveform, and outputs a stream of estimate symbols based on the estimate of the timing offset, as the applicant has claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres  
10-03-2007

  
MOHAMMED GHAYOUR  
SUPERVISORY PATENT EXAMINER